

## DOCUMENTATION OF INDIGENOUS TECHNOLOGIES IN PULSE CULTIVATION AND RELATIVE ADVANTAGE OF INDIGENOUS TECHNOLOGIES

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### ABSTRACT

*In Tamil Nadu the food grains are cultivated in an area of 3474573 ha and the area under pulses are 815800 ha and pulses constituting 23.50 per cent and a tune of total production of 613800 tones and an average productivity of 412 kg per ha Tamil Nadu is one of the major producing State for Black Gram, Red Gram, Green Gran, cowpea, Mochai and Horse gram. In Tamil Nadu Pulses are cultivated by farmers in garden land and dry land conditions. Pulses are one of the oldest crops in Tamil Culture. Pulses growing farmers are cultivating pulses with local own technologies right from seed germination, plant nutrition, plant protection and storage to value addition. The indigenous practices should be documented and validated for further adoption and to solve the present day environmental issues. There are limited studies in documentation indigenous technical knowledge in pulse cultivation. Keeping this in view the study was undertaken to document the indigenous technical knowledge in pulse cultivation and to identify the relative advantage of indigenous technologies in pulse cultivation. The study was undertaken among 300 pulse farmers in Thanjavur, Pudukkottai, Tiruvarur districts. The indigenous technologies in pulse cultivation was collected among 300 experienced pulse growers with well-developed interview schedule. The collected indigenous technologies were given to thirty scientists those who had experience in indigenous technologies in pulse cultivation to eliminate the irrelevant and repeated indigenous technologies. The collected 256 indigenous technologies were given to expert and scientist to eliminate the irrelevant and repeated indigenous technologies. The result revealed that 66 indigenous technologies were identified as relevant. Majority of pulse farmer expressed that safety handling and food is one of the foremost relative advantage in adopting indigenous technologies and it was expressed by 96.00 per cent of pulse farmers.*

**KEYWORDS:** Documentation, Indigenous Technologies, Relative Advantage & Pulse Cultivation

Original Article

**Received:** May 21, 2019; **Accepted:** Jun 11, 2019; **Published:** Jul 10, 2019; **Paper Id.:** IJASRAUG201932

### INTRODUCTION

In Tamil Nadu the food grains are cultivated in an area of 3474573 ha and the area under pulses are 815800 ha and pulses constituting 23.50 per cent and a tune of total production of 613800 tones and an average productivity of 412 kg per ha .Tamil Nadu is one of the major producing State for Black Gram, Red Gram, Green Gran, cowpea, Mochai and Horse gram. In Tamil Nadu Pulses are cultivated by farmers in garden land and dry land conditions. Pulses are one of the oldest crops in Tamil Culture. Pulses growing farmers are cultivating pulses with local own technologies right from seed germination, plant nutrition, plant protection and storage to value addition.

These traditional knowledge and technologies have played a significant role in the overall socio-economic development of the communities. Rhoades (1989) and Goddell (1982) reported that indigenous technologies if identified, modified suitable and accepted they can definitely be the answer for the present day thinking of attaining sustainable agriculture. Farmers are practicing a number of indigenous practices in pulse cultivation. These indigenous practices should be documented and validated for further adoption and to solve the present day environmental issues. There are limited studies in documentation indigenous technical knowledge in pulse cultivation. Keeping this in view the study was undertaken to document the indigenous technical knowledge in pulse cultivation and to identify the relative advantage of indigenous technologies in pulse cultivation.

## MATERIALS AND METHODS

The study was undertaken among 300 pulse farmers in Thanjavur, Pudukkottai, Tiruvarur districts. The districts were selected based on the maximum number of pulse farmers and area under pulse crop. In each districts five blocks were selected based on the area under pulse crop. Two villages were selected in each selected block of each district. Ten pulse farmers were selected randomly in each village and totally 300 pulse farmers were selected for this study. The indigenous technologies in pulse cultivation was collected among 300 experienced pulse growers with well-developed interview schedule. The collected indigenous technologies were given to expert and scientist to eliminate the irrelevant and repeated indigenous technologies. Thirty scientist those who had experience in indigenous technologies in pulse cultivation are consulted to identify the relevant indigenous technologies in pulse cultivation from the collected indigenous technologies. Relative advantage is the degree to which an innovation appears better than any other alternatives the potential adopter might have, measured in terms of economics, convenience, satisfaction and social prestige. The pulse farmers were asked to list out the relative advantages of Indigenous technologies over the scientific cultivation in pulse cultivation.

## RESULTS AND DISCUSSION

### Collection and Documentation of Indigenous Technologies Adopted by Farmers in Pulses Cultivation

The indigenous technologies in pulse cultivation was collected among 300 pulse growers in Thanjavur, Pudukkottai and Thiruvarur districts. The collected 256 indigenous technologies were given to expert and scientist to eliminate the irrelevant and repeated indigenous technologies. Thirty scientist those who had experience in indigenous technologies in pulse cultivation are consulted to identify the relevant indigenous technologies in pulse cultivation. The result revealed that 66 indigenous technologies was identified as relevant and presented below.

#### Indigenous Technical Knowledge Identified

S. No.	Indigenous Technical Knowledge
	<b>Land Preparation</b>
1.	Achieving fine tilth is better than applying manures
2.	It is better to plough intensively than extensively
3.	It is better to have deep ploughing rather than shallow ploughing for pulse growth
4.	Plough four times for garden land
5.	Plough seven times for wet land
6.	Summer ploughing gives good crop in the ensuing season
7.	Mixing and applying coir waste with compost to arrest soil hardening
8.	Organic Manuring and Mulches increases the yield
	<b>Seeds &amp; Sowing</b>
9.	Yield of the crops depends on seed quality, before sowing, knowing the quality of seed.
10.	Seed should be a dried one because well dried seeds will have higher longevity and keeping quality.

11	It is better to change the seeds atleast once in two years
12	The seeds are generally stored along with the leaves of neem, pungam, notchi and thusasi
13	Better to start planting from “Sanimoolai” (North East) of the field to get higher yields.
14.	Severing the broadcasted seeds in dry lands with soil
15	Better to perform sowing and planting operations during evening hours
16	The best seasons for pulse sowing are “Thai pattam” & Chithraipattam
17.	The pulse crop sown on new moon day escape from pest and disease
18	Pulse sowing is done on all days except Tuesday and Saturday
19	Yield will be lower in black gram crop if it is sown in snow season/heavy mist season
20	Pulse sowing in September second week, giving better yield.
21	Micronutrient mixture liquid form
	<b>Manuring</b>
22	Applying water hyacinth plants either as a compost or as burnt ash to the field for supplying potash
23	Poultry manure and goat manure gives benefits to pulse crops grown in the same season
24	Higher Blooming of “Tamarind” is. considered as an indication for good pulse production and higher blooming of “Mango” is considered as an indication for poor pulse production
25	Sheep penning results in more pulse yield
26	Perennial Vegetation is grown in the irrigation channel converted in to green manure.
27.	DAP spraying during full moon season, enhances more flowering
	<b>Weed, Pest and Disease Management</b>
28.	Red gram is also used as a green manure crop which improves the soil fertility
29	Growing cow pea as a green manure to control nut grass
30.	Growing horse gram to control nut grass.
31.	To avoid to cultivate pulse cop during severe summer season
32	Spray neem oil 5 lit./ac to control downey mildew disease in pulses
33.	Spray purified milk to control yellow mosaic disease in cow pea and black gram.
34.	Pulse crop mixed with Sorghum to control wilt disease in pulse.
35.	Pulse crop mixed with “Marigold” to control pest in pulses.
36.	Spray Panchakavya in pulse crops to control yellow mosaic disease.
37.	Spray Navakavya in pulse crops to control many diseases in pulses also get good yield.
38.	Pulse crops rotation with sorghum and rice to control wilt disease
39.	In pulse crops, sprinkling common salt to control wilt disease.
40.	Light trap and small lamps are placed on either side of the house entrance light from the lamps act as light trap the farmers are also to identify the pest outbreak.
41.	Kitchen ash is applied in pulse crops to control aphids.
42.	In pulse crops to control sucking pests, spray tobacco powder, cow urine, and neem oil spray.
43.	In pulse crops to control nematodes, pungam (Pungamia pinnata) or illuppai (Bassic Latitolia) cakes are applied.
44.	In pulse crops, spray panchakavya solution to add micronutrients,
45.	Dried fish extract solution spray in pulses to control many pests.
46.	Spray tobacco decoction to control warm and sucking pests in pulses.
47.	Grinding the leaves of “Ipomia cornia” soaking in water 15 days, filtering and spraying to control boll warm in red grams.
48.	Using pest avoidance technique
49.	Seed treatment with “Asafotida” to control boll warm in red gram.
50.	Spacing between red gram crops to be increased to control boll warms.
51.	Raising one row of red gram crop with two rows of black gram crop to control pests and disease
52.	October month having conducive climate for boll warms in pulses to avoid this month to escape from boll warm attack.
53.	Raising Coriander crop to control boll warm in pulses
	<b>Seed Storage and Postharvest Storage Technologies</b>
54.	Mixing the green gram seeds with sand before storage.
55.	Black gram grains broken in to halves will escape from weevil attack during storage
56.	Castor seeds are fried, powdered and mixed with red gram seeds to reduce pest attack during storage
57.	Pulse seeds in earthen pots mixed with wood ash to keep away from storage pests
58.	Red gram seeds are mixed with red earth slurry, dried and stored to avoid storage pests.

59.	Dry the red gram seeds well and store them in gunny bags after placing dried leaves of “Naithulasi” ( <i>Ocimum canum</i> ) inside them to prevent pod borer.
60.	Vegetable oil and castor oil are mixed with pulses before storage
61.	Mixing pulse grams with dried chilies to increase the keeping quality and avoid from storage pests like “brooches”
62.	Spread cooked rice in the field bund to attract birds; these birds collect /eat worms in pulse field.
63.	Dusting ash along with pulse seeds to control storage pests.
64.	Neem seed kernel extract is the general organic pesticide used to control many pests in pulses
65.	Neem seed cake mixed with seed pulses to preserve in container to avoid storage pests.
66.	10 Kgs. pulse seeds mixed with 500 gm. of turmeric power, 500 ml. groundnut oil for storage even for one year

### Relative Advantage of Indigenous Technologies in Pulses

When the farmers continuously practicing indigenous knowledge, it will be also relevant to enquire why they do so. In other words, what are the advantages of such practices as perceived by farmers. Understanding the rational of such practices from the farmer's point of view, may also help researchers to look into the valid factors while they research to farmers need and help extension workers to select appropriate technologies based on few criteria. The relative advantage of indigenous technologies are presented in table 1.

The pulse farmers were expressed their perceived relative advantage of adopting the indigenous technologies. The results from table 1, shows that majority of pulse farmer expressed that safety handling and food is one of the foremost relative advantage in adopting indigenous technologies and it was expressed by 96.00 per cent of pulse farmers.

The indigenous technologies facilitate the agricultural operations ie facilitate for easy sowing of crop and it was expressed by 95.00 per cent of farmers followed by good germination with 95.67 per cent, quality product with 89.00 per cent, healthy crop with 89.00 per cent and low cost with 78.00 per cent of pulse farmers.

Three fifth of farmers (69.33 per cent) were expressed that indigenous technologies helped in conservation of moisture during drought period and controlled the soil erosion (52.00 per cent). Nearly half of the pulse farmers (44.67 per cent) expressed that indigenous technologies maintained the soil health sustainably. Two third of farmers (66.67 per cent) expressed that indigenous technologies resulted more yield in the subsequent years. The farmers expressed that the indigenous technology resulted health crop (89.00 per cent), products having long shelf life (69.66 per cent) and environmental safeguard (66.00 per cent).

### CONCLUSIONS

More number of indigenous technologies are available in all the agro eco system and in all the crops. The documented pulse indigenous technologies are having more advantage when compared to present day cultivation. The documented indigenous technologies should be validated for further large scale adoption to reduce the soil health problem and for environmental safety.

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## APPENDIES

**Table 1: Relative Advantage of Indigenous Technologies in Pulses Cultivation**

S. No	Category	Number	Percent
<b>I. Land preparation</b>			
1.	Conservation of moisture during drought period	208	69.33
2.	Eradication of weeds	182	60.67
3.	Control of soil erosion	156	52.00
4.	Reduction of no of ploughings at the time of sowing	200	66.67
<b>II. Seeds and sowing</b>			
1.	Pest reduction	150	50.00
2.	No cost	234	78.00
3.	Easy dibbling of seed sowing to fuzz removal	285	95.00
4.	Good germination	287	95.67
<b>III. Manuring</b>			
1.	Low cost	198	66.00
2.	Healthy crop	201	67.00
3.	Soil health sustainability	134	44.67
4.	Quality product	267	89.00
<b>IV. Weed Management.</b>			
1.	Low cost	234	78.00
2.	Better yield	200	66.67
3.	Quality product	176	58.67
<b>V. Pests and Diseases Management</b>			
1.	Low cost	200	66.67
2.	Healthy crop	267	89.00
3.	Pest repellent/disease smoothing	222	74.00
4.	Environmental safeguard	198	66.00
<b>VI. SeedStorage and post-harvest Storage technologies</b>			
1.	Low cost	178	59.33
2.	Pest control	156	52.00
3.	Longer shelf life	209	69.66
4.	Safety handling and food	288	96.00

